

Serial No. 09/716,854
Attorney Docket No. E0886
Firm Reference No. AMDSP0374US

Reply to Office Action Dated February 12, 2004
Reply Dated March 3, 2004

AMENDMENTS IN THE SPECIFICATION:

In the Specification:

Please replace the paragraph beginning at page 4, line 4, with the following rewritten paragraph:

B¹

As described below, a network medium interface device includes a pair of physical layer devices (PHYs) for transmitting and receiving signals on a network medium, and a pair of media access controllers (MACs) for monitoring the network medium and controlling transmissions on the network medium. The PHYs are used to transmit and receive frames or packets in accordance with respective, different standards or specifications. Depending on the capabilities of the network nodes to send and receive frames or packets in one or both of the specifications, one or the other of the MACs is selected to monitor the network medium and control access to the network medium. Thus information on the capabilities and activities of other nodes on the network may be gathered, via hardware or software. This node capability information may be used to determine the "topology" of the network, which in turn may be used to determine which of the MACs is used to monitor the network medium. The node capability information may also be used to determine which of the PHYs should be used to transmit a particular data frame or packet to an intended destination node.

Please replace the paragraph beginning at page 5, line 1, with the following rewritten paragraph:

B²

Data received by the PHYs 21 and 22 from the network medium 44 is passed along to a receive processing block 26. The receive processing block 26 may include well-known devices such as state machines and FIFOs, and may perform functions such as assembling and/or reformatting frames or packets of data received, performing error checks on the frames, compiling and appending data to the frames or packets, and stripping unnecessary bits from the received frames or packets. As explained in greater detail below, the receive processing block 26 may send data and/or information to a node discovery block 28,

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which may obtain, retain, and communicate node capability information and/or network topology information. The node discovery block 28 may include an electronically-readable storage device, such as a cache, for storing information regarding various nodes of the network, for example information regarding the capabilities of the nodes.

Please replace the paragraph beginning at page 5, line 18, with the following rewritten paragraph:

B3
A transmit processing block 32 is coupled to the control block 30 for handling data to be transmitted on the network medium. The transmit processing block 32 may include devices such as state machines, FIFOs, and routing blocks. The data to be transmitted may be data generated from the ~~higher-level device block~~ MII 12. Alternatively, the transmitted data may be generated by the interface device 10 itself, such as by the control block 30. For instance, the interface device 10 may generate frames or packets, or may otherwise send data, regarding its capabilities, indicating its presence on the network, confirming successful receipt of data sent by another node, and/or requesting retransmission of frames or packets previously sent by another node on the network.

Please replace the paragraph beginning at page 7, line 1, with the following rewritten paragraph:

B4
As explained further below, the transmit processing block 32 is operatively coupled to the node discovery block 28. The transmit processing block 32 may send queries to the node discovery block 28 regarding the capabilities of the destination node to which a frame or packet is to be transmitted. The node discovery block 28 may respond with an indication of which of the PHYs 21 and 22 is to be used in transmitting a frame to the indicated destination node.

Please replace the paragraph beginning at page 7, line 24, with the following rewritten paragraph:

B5
Depending on the topology of the network (the capabilities of the various nodes), either the first MAC 41 or the second MAC 42 is used to monitor the network medium and control transmission of frames thereupon. For example, if all of the nodes of the network are able to operate with enhanced capabilities (e.g., sending frames with various priority levels), one of the MACs may be active (used to monitor the network medium and control transmission of frames). The active MAC in such a case is the MAC which is able to handle the enhanced capabilities. The other MAC (not configured to take advantage of the enhanced capabilities) may be the active MAC when the network includes nodes that do not operate with the enhanced capabilities (a "mixed network" topology).

Please replace the paragraph beginning at page 8, line 23, with the following rewritten paragraph:

B6
Turning now to Figs. 3 and 4, two configurations as are shown for attaching the interface device 10 to higher-level blocks and a network medium. In Fig. 3, a network node 50 includes the interface device 10 as a means for connecting a host, such as a host computer 52, to a network medium 54. In the host computer 52, data from operating system or application software 56 is received and processed by a software device driver arrangement 60.

Please replace the paragraph beginning at page 8, line 29, with the following rewritten paragraph:

B7
The operating system or application software 56 creates data and notifies a network interface, for example using TCP/IP, that data is waiting to be sent to a specific node of the network. The network interface apparatus translates the destination node information into a destination address, reformats the data as necessary, and sends the data to the device

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B⁷

driver arrangement 60 via a defined interface, for example via an interface following the NDIS (Network Driver Interface Specification) or ODI (Open Data-link Interface) specifications. The device driver arrangement 60 may reconfigure the data into a format compatible with devices downstream toward the network medium 54, and may create and add header information such as source and destination addresses, and data transmission speed. The device driver arrangement 60 may also divide data from the operating system or application software 56 into frames or packets of suitable length.

Please replace the paragraph beginning at page 9, line 11, with the following rewritten paragraph:

B⁷

The frames or packets pass from the device driver arrangement 60 to a system MAC 64. The system MAC 64 may be part of a network interface card 66 which is installed in the host computer 52. The system MAC 64 may prepend or append additional information to packets received from the device driver arrangement 60. For example, the system MAC 64 may calculate and append some form of frame check sequence (FCS), such as a cyclic redundancy check (CRC), to the frames or packets.

Please replace the paragraph beginning at page 12, line 1, with the following rewritten paragraph:

B⁹

It will be appreciated that the intermediate driver 80 ~~include~~ includes some or all of the functions of gathering, storing, and communicating information on network topology, which were described above with regard to the node discovery block 28. Thus the intermediate driver may gather node capability information from frames received by the interface device 10 and passed to the intermediate driver 80. Also, node capability information may be gathered from capabilities and status announcement (CSA) frames which may be sent by other nodes to provide information about that node and/or about the network topology. CSA frames may be broadcast frames, may be sent at specified intervals, and may include information about the capabilities of the sending node (e.g., the

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rate at which the node is capable of transmitting and receiving, and/or the capability or lack thereof for specified enhanced operation features), the mode of operation of the sending node, and the network topology perceived by the sending node.

Please replace the paragraph beginning at page 13, line 8, with the following rewritten paragraph:

B10

It will be appreciated that the configuration of the network node 50 shown in Fig. 3 and described above is merely exemplary, and that the network node 50 interface may have a different configuration if desired. For example, the intermediate driver 80 may alternatively be placed between the system MAC device driver 78 and the system MAC 64. Alternatively, the device drivers 78 and 80 may be replaced by a single driver, if desired.

Please replace the paragraph beginning at page 13, line 19, with the following rewritten paragraph:

B11

Turning now to Fig. 4, a network node 100 is shown which also includes the interface device 10 described above. The network node 100, which may be part of a host computer 112, includes application and/or operating system software 116, and a software driver 118 coupled to the application software. The software driver 118 is coupled to the PCI 14 of the interface device 10, for example via a bus of the host computer 112. The network medium interface device 1032 is operatively coupled to a network medium 114, which may be of the same type as the network medium 54 described above.

Please replace the paragraph beginning at page 15, line 1, with the following rewritten paragraph:

B12

In step 202 of the method, the destination address (DA) of the received frame is examined by the frame examination sub-block 44 to see if the DA is the same as the address of the

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node that the interface device 10 is part of. If not, then the received frame is intended for reception by another node, and no node capability information is ~~gather~~ gathered from the frame (the node capability information from the frame is not entered into the cache 45 maintained by the node discovery block 28).

Please replace the paragraph beginning at page 15, line 20, with the following rewritten paragraph:

B¹³

If the received frame is determined in step 210 to have valid check sequences, then the node capability information regarding the sending node is extracted in step 212 and forwarded for storage, by the storage sub-block 46, in the cache 45. The extraction of the node capability information may include examining a field of the received frames. For example, the node capability information may include the type of node that sent the received frame, and the determining whether the received frame is from an HPNA 1.0 only node or an HPNA 2.0 capable node may include examination of a field in the received frame which has a nonzero value only for transmissions from HPNA 1.0 only nodes. The examination of such a field ~~field~~ may be performed by the frame examination sub-block 44. Alternatively, the examination of the field may be performed by the receive processing block 26 or the PHYs 21 and 22, with the results forwarded to the node discovery block 28.

Please replace the paragraph beginning at page 16, line 3, with the following rewritten paragraph:

B¹⁴

Fig. 8 is a high-level flow chart of a method 220 to store the node capability information in the cache 45 ~~of~~ if the node discovery block 28, by the storage sub-block 46 of the node discovery block. In step 222, the storage sub-block 46 examines the cache 45 to determine if there is a current entry in the cache corresponding to the node source address (SA) of the node which sent the received frame. If so, the cache entry corresponding to

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the SA is updated in step 224 by writing the newly-acquired node capability information over the old node capability information.

Please replace the paragraph beginning at page 20, line 4, with the following rewritten paragraph:

B15
If the VALID bit is not set, then the destination address is extracted from the frame in step 320. In step 322 the destination address is used to query the node discovery block 28 for information regarding the destination node, specifically for information regarding which of the MACs should be used to transmit the frame. For example, the retrieval sub-block 47 may be used to access a node discovery table stored or other repository of node capability information, stored in the storage sub-block 46. The response is used in step 326 to select which of the MACs 41 and 42 will be used for transmitting the frame. It will be appreciated that a default MAC may be selected ~~for~~ for transmitting the frame if no node capability information regarding the destination node is available. The frame is then transmitted on the selected MAC in step 316.
